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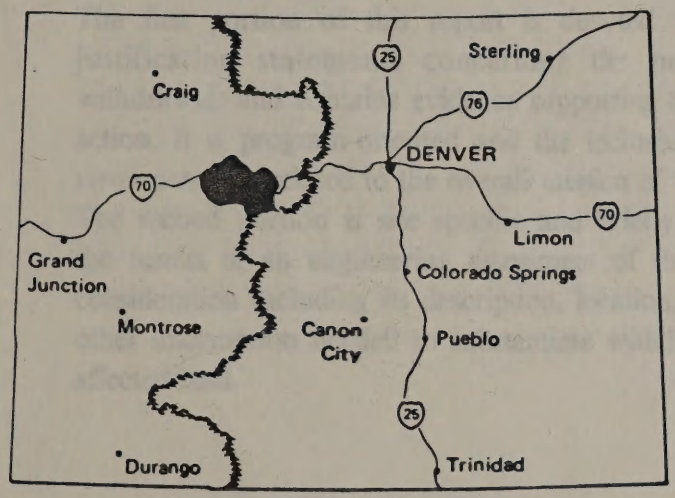
WATERPOWER PROGRAM
ENGINEERING EVALUATION REPORT

WOLCOTT No. 2 RESERVOIR
EAGLE RIVER, COLORADO



COLORADO

Prepared By:

Colorado State Office
Bureau of Land Management
Department of Interior

September 1988

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Introduction

The Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2743, P.L. 94-579), mandated the acceleration of the review of withdrawals. Withdrawal review was already occurring under guidance provided by Interior Departmental Manual Section 603, but must now be completed by 1991. Current guidance directs the generation of a justification package substantiating the need for the withdrawal. This report fulfills that requirement. This report is generated by the Colorado State Office (CSO) of the Bureau of Land Management, such office having regional responsibility to evaluate all sites in withdrawal east of the Continental Divide and all of the state of Utah. In addition, this report contains information useful to the personnel processing the withdrawal cases and to planners and land management personnel that are interested in the potential resource that warrants the withdrawal.

Organization of the Report

The first portion of this report is devoted to necessary justification statements concerning the program and withdrawals and contains evidence supporting the requested action. It is program-oriented and the inclusive statements cover concepts related to the overall mission of the program. The second portion is site specific and briefly summarizes the results of an engineering assessment of the site under consideration including its description, location, values, and other information needed to substantiate withdrawal of the affected land.

Withdrawal and Statutory Program

The Congress of the United States has enacted legislation providing the authority to withdraw waterpower sites and reservoirs from certain operations of the public land laws including entry, selection and location on at least eight different occasions. The legislative intent certainly appears to be in the national interest as the sites are finite in number, fixed in position, increasingly scarce, irreplaceable, and provide a potential source of renewable energy. The withdrawal action places discretionary constraints on the land manager and leaves the ultimate decision authority with the Secretary of the Interior. The withdrawals in this area were made under the authority of the Act of March 3, 1879 and the Act of June 25, 1910.

Life Term

These withdrawals are a form of long range planning to assure the sites will be available if and when they are needed. As such, the withdrawals do not have a specific life term as they are being held in reserve until needed and not a withdrawal for a use that will someday be exhausted or become obsolete. The validity of this approach has been historically indicated and is presently being indicated again by the increasing need for planning for the development of water resources. Adequate supplies of pure water for human consumption and economic security is the next major resource management crisis predicted for the nation.

Alternatives to Withdrawal

Historically land management agencies had the authority to license waterpower projects prior to the Federal Power Act of 1920. The licensing authority was given to the Federal Power Commission to eliminate the inefficiency and confusion caused by a piecemeal, restrictive, and negative approaches to licensing. It would not be prudent to subject the long range planning of these projects to questionable approaches of this nature in several different management agencies; therefore one agency has been given the advocacy for resource consideration and its protection responsibility (Department of the Interior). The Water Resources Planning Act of 1965 (PL 89-80) further pointed out the need for more consistent planning efforts that transcend agency responsibilities. The withdrawals and potential sites should be included in all management plans as the sites are far too important to leave management of them to individual managers discretion for actions that may destroy their development potential.

Water Needs

Because the withdrawal does not commit the government to the construction of the site, but does assure that the site is there if needed, water rights are not obtained by the government for the site. Certainly development of the site, as opposed to the withdrawal of the site, will necessitate water and water rights. Obtaining the water rights, plus the authority to develop, including assessing the environmental impacts, etc., are the responsibility of the developer. Water has been established as a commodity that is regulated under the Commerce Acts, and certainly water rights can be acquired dependent upon individual states' legislation. Therefore, the lack of water rights does not invalidate the value and potential development of the site.

Support

The withdrawals do not reduce or transfer existing land management responsibilities. They were made in close liaison with the management agency at the field level as well as the national level and, in some cases, at the request of the management agency. Interests of potential developers were also considered and in at least one instance withdrawals were made at the request of the U.S. Corps of Engineers. Other governmental agencies with known current interest in the potential developments are contacted before action is taken on the withdrawal. Concurrence for revocation is sought from the land administration agency before action is taken. Provisions for requesting the revocation of any withdrawal by the land administration agency has been in place since 1920.

Buffer and Safety Zones

Actual construction of dams and reservoirs requires buffer and safety zones in specific instances but the withdrawal of land that may be occupied by the site does not. The withdrawal should be made large enough to contain the largest reasonable configuration of possible development. This includes lands at the highest elevation that the reservoir would inundate as well as the furthest downstream alternative site where the dam could be located. More land will be necessary around the damsite for construction, spillways, substations, etc. but the minimum amount of land needed for site preservation should also be identified.

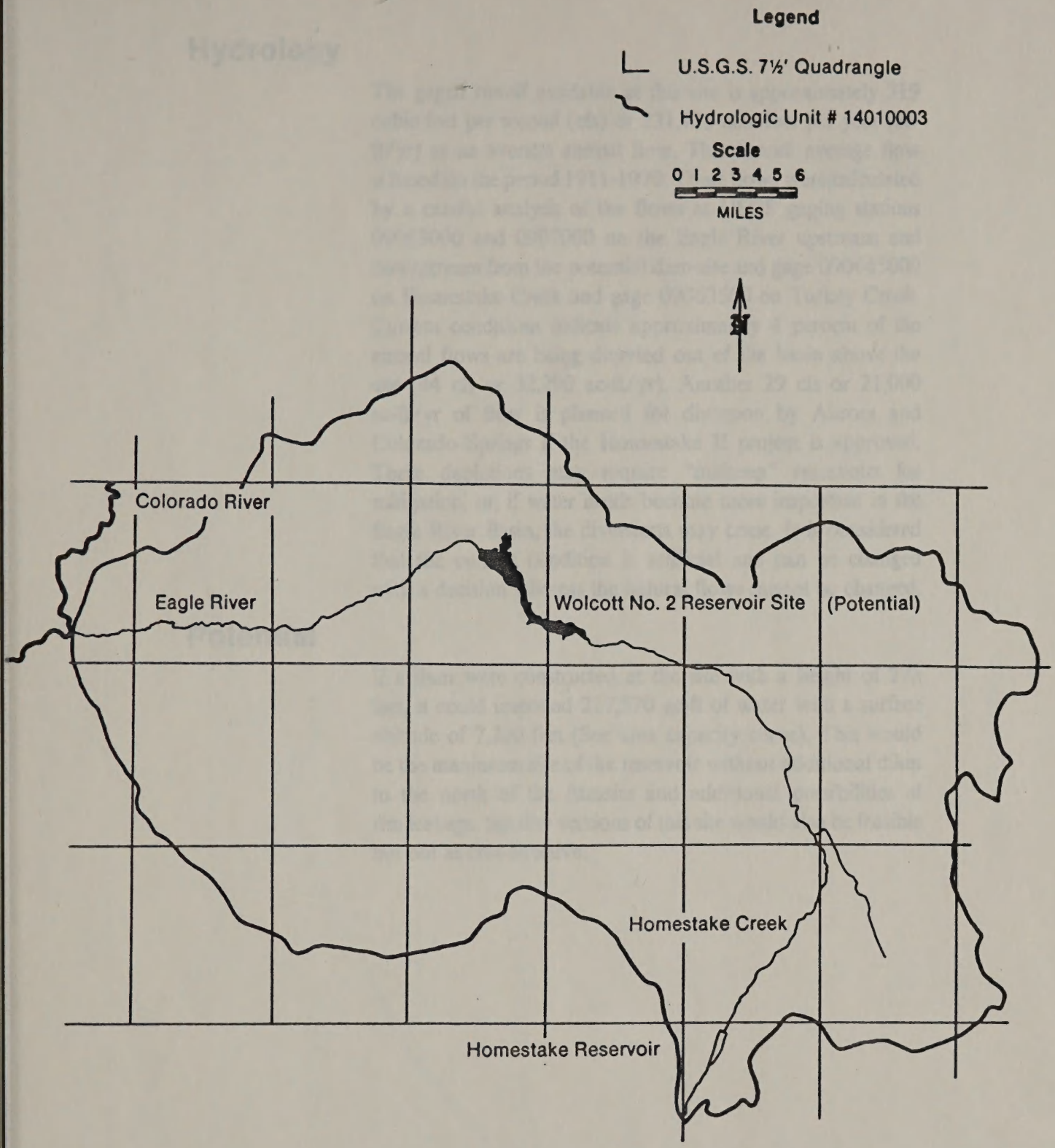
Appeal for Approval

The Bureau of Land Management has been given the responsibility to recommend to the Secretary of the Interior the further withdrawal of land, the continuation or termination of the existing withdrawals. The withdrawals and terminations are made by the Secretary of the Interior through statutory authority and/or delegated authority. Under the provisions of Sec. 204(l) of the Federal Land Policy and Management Act (FLPMA), the Secretary's decision is presently being reviewed by the President and by Congress. Therefore, it is imperative that the Bureau provide the Secretary with sufficient accurate information, to enable his decision to stand the scrutiny of further review. The opportunity exists for the resource specialists and the land manager to jointly coordinate efforts and expertise for the public interest.

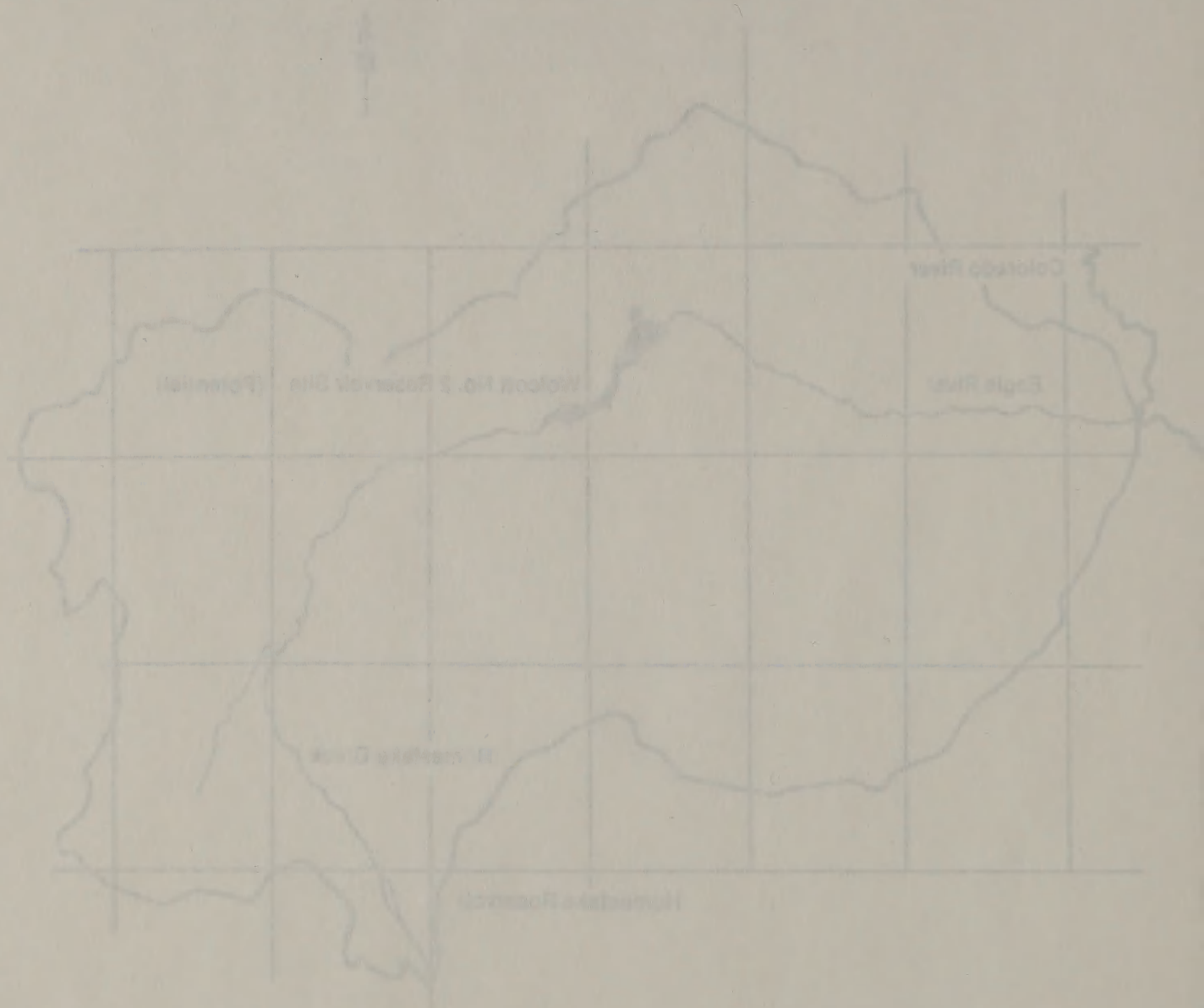
Appeal for Approval

Site Location

The Wolcott Reservoir Site is located in Eagle County, Colorado on the Eagle River. Based on the Public Land Rectangular Surveys, the site is located in the NW¼SW¼ of Section 15, Township 4 South, Range 83 West of the Sixth Principal Meridian. The area of the damsite is shown on the USGS Wolcott, Colorado topographic quadrangle maps (scale 1:24,000). The water surface altitude of this stream at the damsite is approximately 6927 feet and the calculated drainage area at the site is 523 square miles.



Hydrologic Unit # 14010003, Eagle River, Colorado

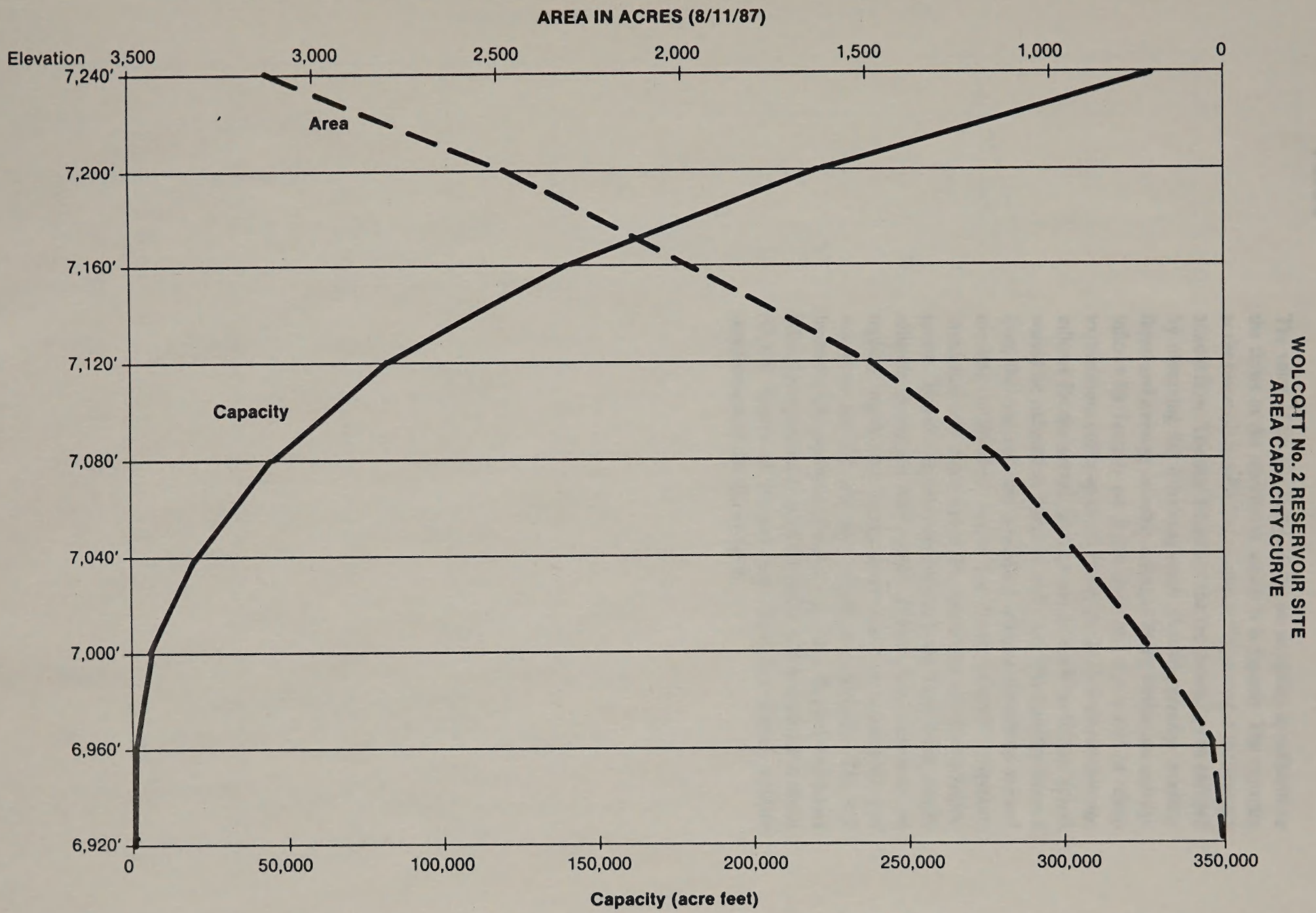


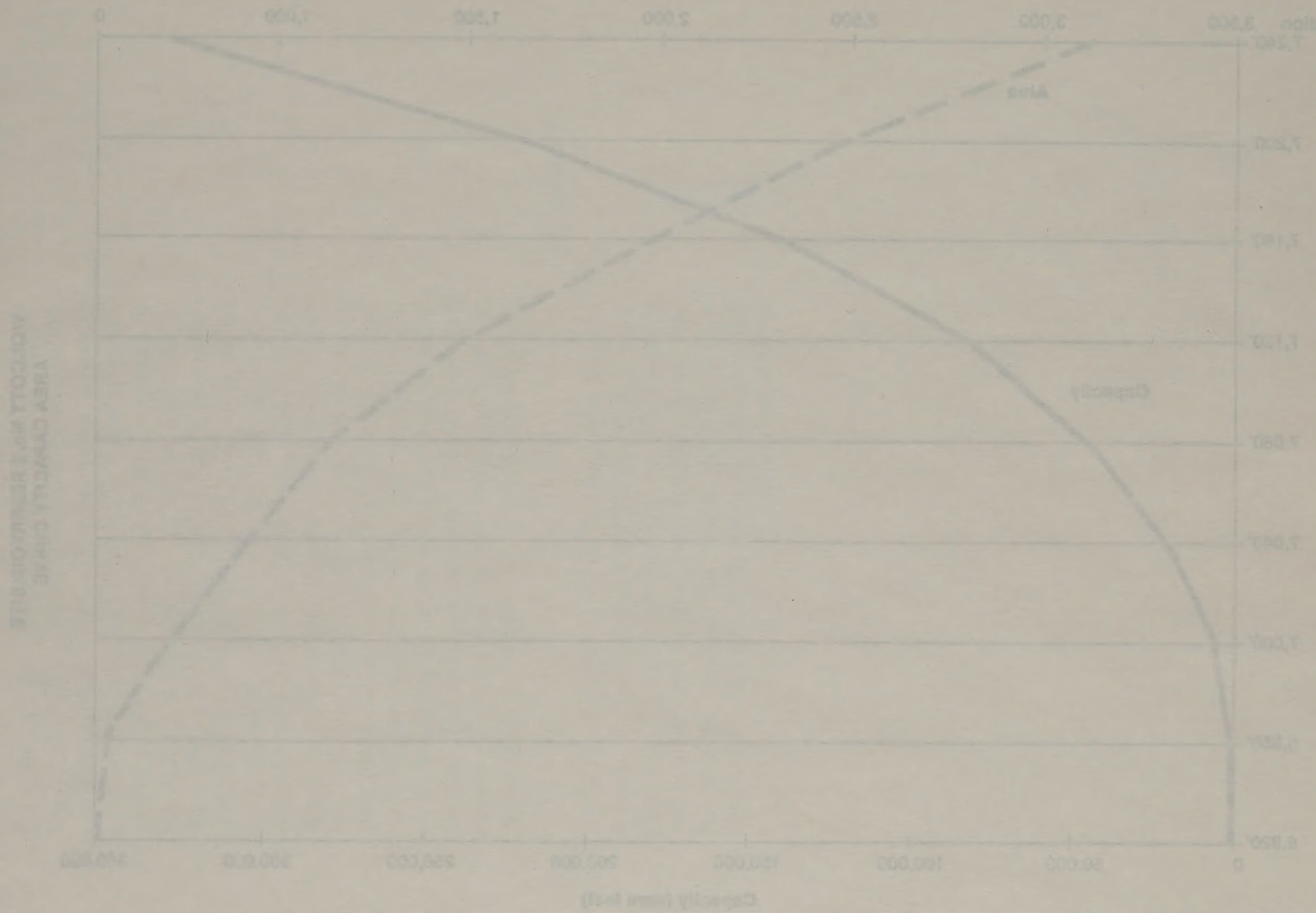
Hydrology

The gaged runoff available at this site is approximately 319 cubic feet per second (cfs) or 231,173 acre-feet per year (ac-ft/yr) as an average annual flow. This overall average flow is based on the period 1911-1970. These flows were calculated by a careful analysis of the flows at USGS gaging stations 09063000 and 0907000 on the Eagle River upstream and downstream from the potential dam site and gage 090645000 on Homestake Creek and gage 09063500 on Turkey Creek. Current conditions indicate approximately 4 percent of the annual flows are being diverted out of the basin above the site (44 cfs or 32,290 ac-ft/yr). Another 29 cfs or 21,000 ac-ft/yr of flow is planned for diversion by Aurora and Colorado Springs if the Homestake II project is approved. These depletions may require "makeup" reservoirs for mitigation, or, if water needs become more important in the Eagle River Basin, the diversions may cease. It is considered that the current condition is artificial and can be changed with a decision whereas the natural flows cannot be changed.

Potential

If a dam were constructed at the site with a height of 273 feet, it could impound 217,570 ac-ft of water with a surface altitude of 7,200 feet (See area capacity curve). This would be the maximum size of the reservoir without additional dikes to the north of the damsite and additional possibilities of rim leakage. Smaller versions of this site would also be feasible but not as cost effective.

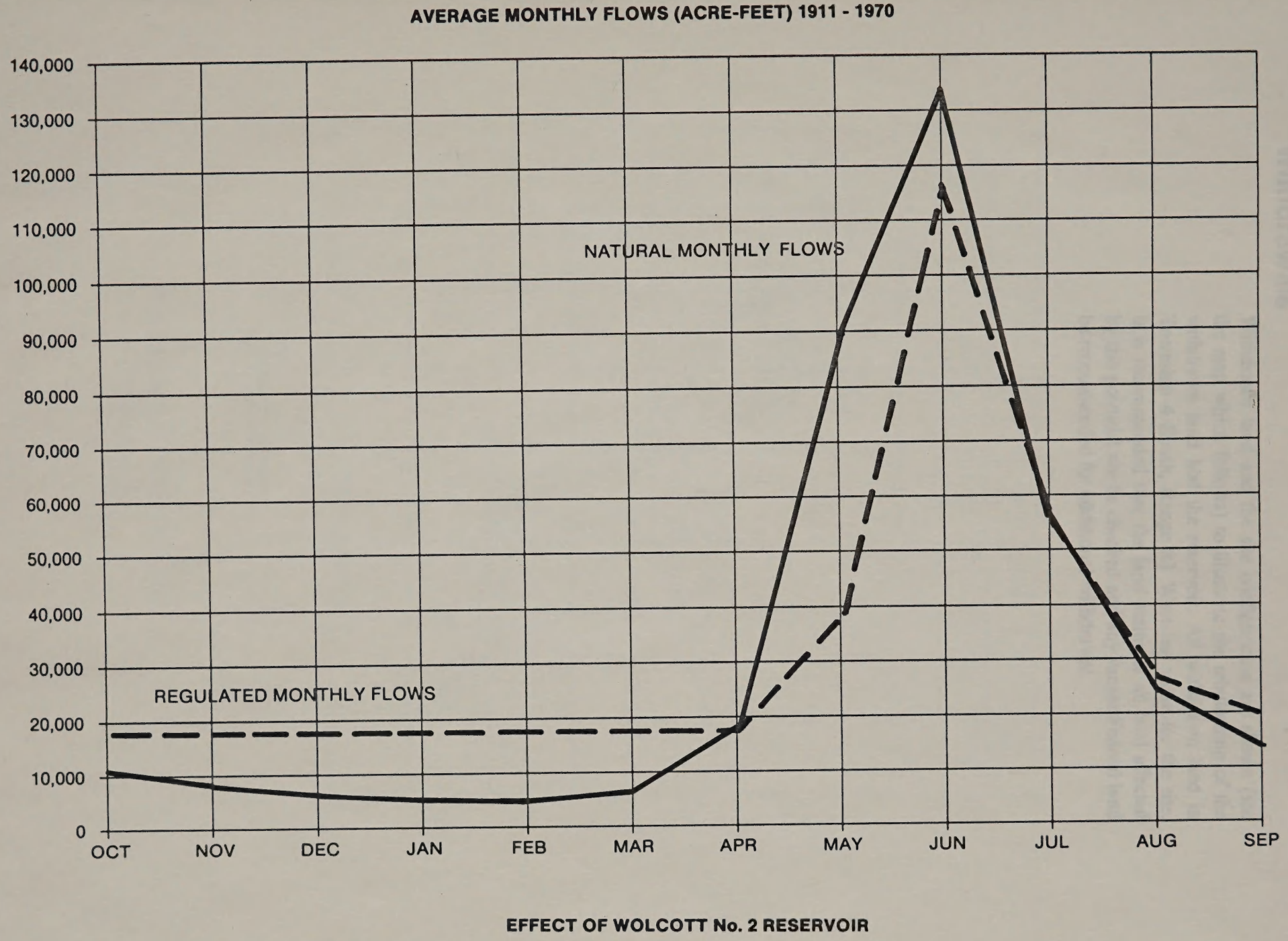

AREA IN ACRES (8/11/87)
Elevation
3,500
3,000
2,500
2,000
1,500
1,000
0
7,240′
7,200′
7,160′
7,120′
7,080′
7,040′
7,000′
6,960′
6,920′
Area
Capacity
0
50,000
100,000
150,000
200,000
250,000
300,000
350,000
Capacity (acre feet)
WOLCOTT No. 2 RESERVOIR SITE
AREA CAPACITY CURVE

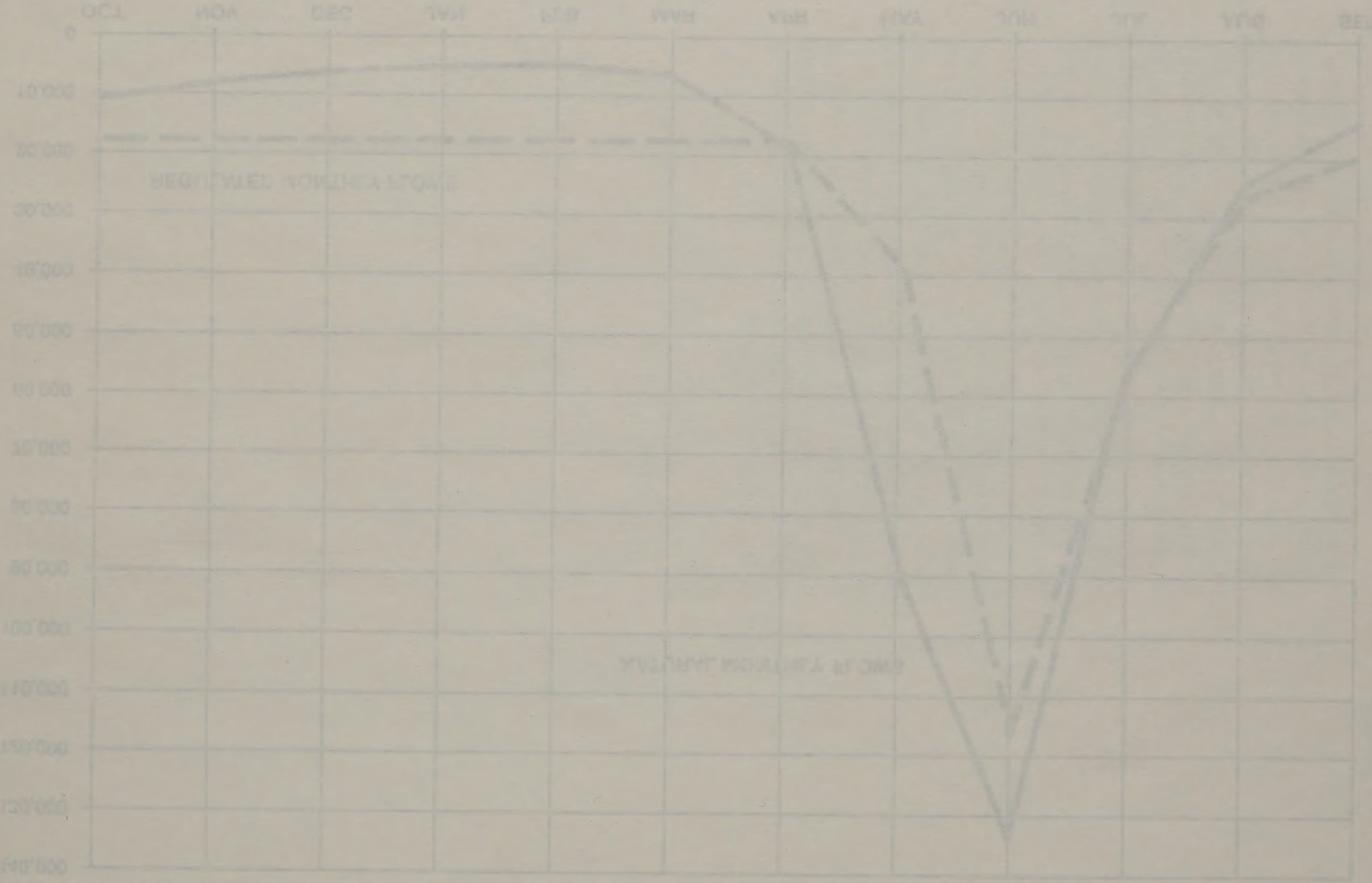


Value

The value of the site is dependent on its ability to redistribute the flows in the stream on which it is located. The capacity at the reservoir is sufficient to release 56 percent of the average annual flow. The significance of the regulation can be realized by observing the following chart showing average monthly flows and average monthly released flows. Minimum average inflows for January are 5,064 ac-ft/mo. that would be raised to minimum outflows of 17,709 ac-ft/mo. Maximum average inflows for the month of June are 134,406 ac-ft/mo. which would be reduced to 116,511 ac-ft/mo. The benefits derived from the reservoir and regulated releases contribute toward meeting established needs for flood control, irrigation, municipal and industrial flows, recreation and hydroelectric power. Flood control and irrigation are local basin needs, whereas municipal and industrial flow and recreation are regional needs. The hydroelectric needs are nationwide and not local but the site can contribute nationally. The full hydroelectric potential of the site is about 88 giga-watt hours (Gwh) per year on a renewable basis which converts to about 37,930 barrels of oil per year. This fact almost justifies construction of the site by itself.

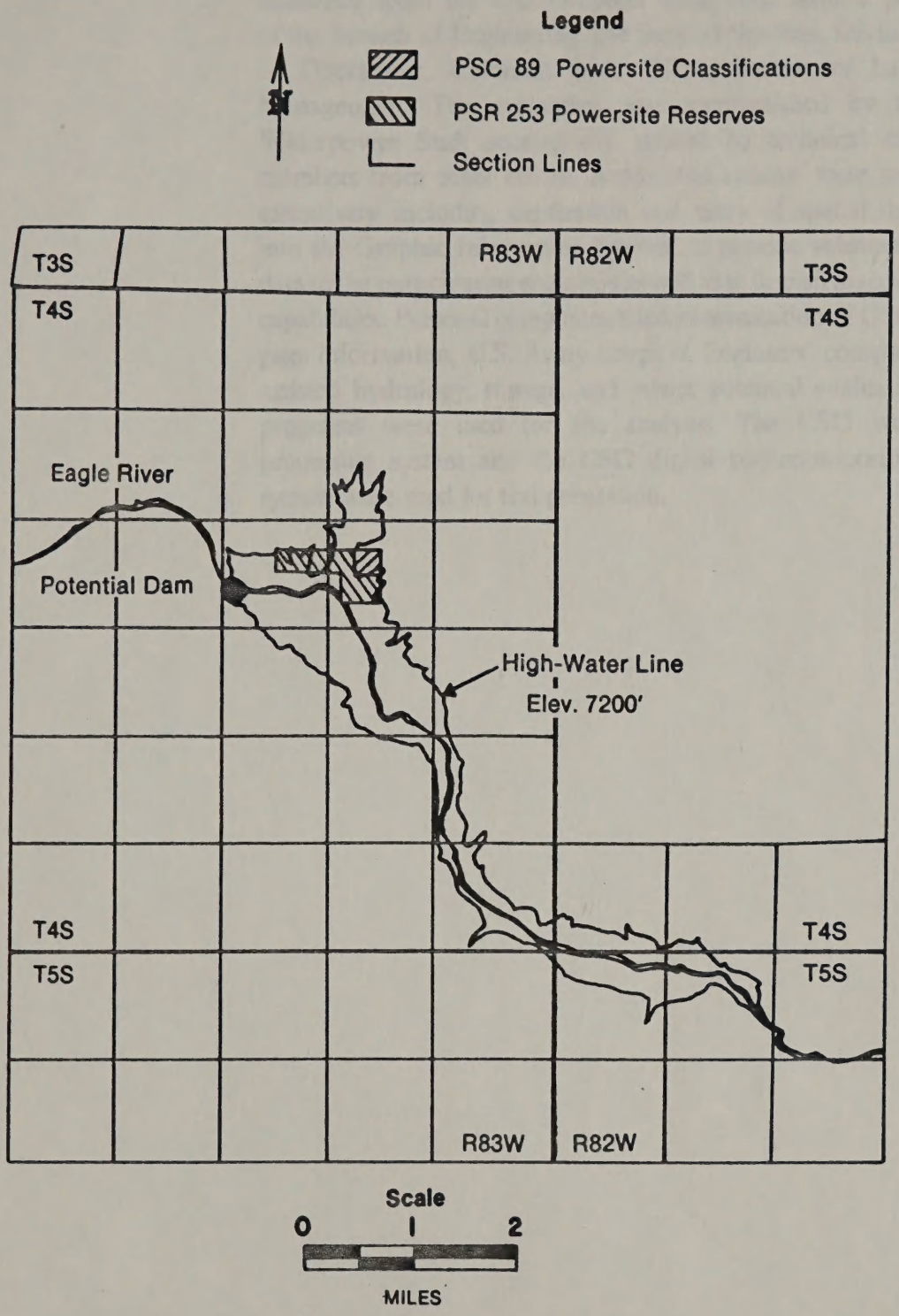
Value


AVERAGE MONTHLY FLOWS (ACRE-FEET) 1911 - 1970
140,000
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
NATURAL MONTHLY FLOWS
REGULATED MONTHLY FLOWS
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
EFFECT OF WOLCOTT No. 2 RESERVOIR

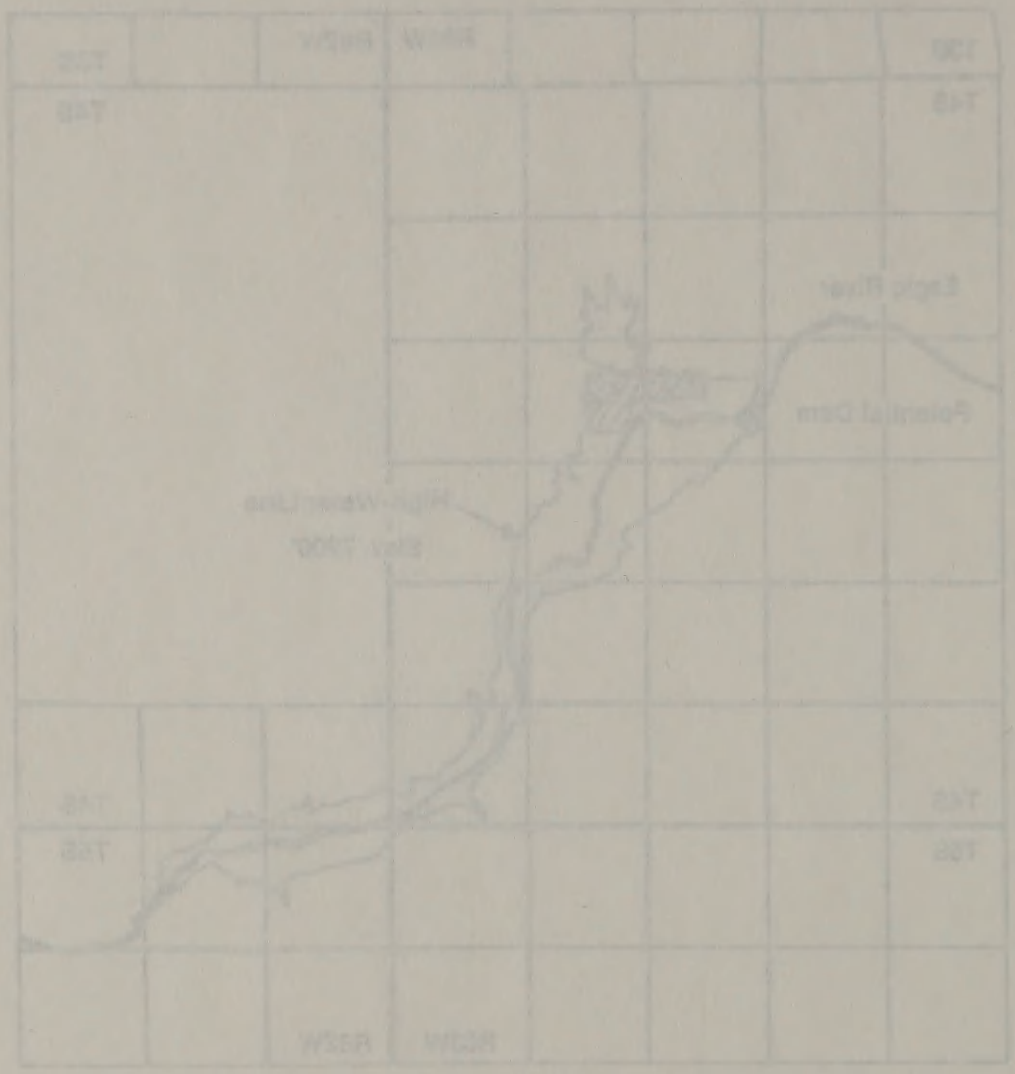


Withdrawals

Withdrawn land and the site configuration are shown (see the map which follows) to illustrate the relationship of the withdrawn land and the reservoir. All withdrawn land in Township 4 South, Range 83 West has value for the site. It is recommended that the land status of all land affected by this potential site be checked and any vacant Federal land be recommended for additional withdrawal.



Wolcott No. 2 Reservoir Site
(Potential)



Acknowledgment

This report was produced by the Waterpower Staff with assistance from the GIS/Graphics Staff, both staffs a part of the Branch of Engineering and Support Services, Division of Operations, Colorado State Office, Bureau of Land Management. The evaluation was accomplished by the Waterpower Staff occasionally assisted by technical staff members from other offices. Automated systems were used extensively including digitization and entry of spatial data into the Graphic Information System, to provide volumetric data to the participating engineers as well as to furnish mapping capabilities. Personal computers, telecommunication of USGS gage information, U.S. Army Corps of Engineers' computer assisted hydrology, storage, and power potential evaluation programs were used for site analyses. The CSO word processing system and the CSO digital photocomposition system were used for text generation.